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P. Gao  
6/13/03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:  
Paul G. Mudd

Application No.: 09/935,617

Group Art Unit: 3654

Filed: October 5, 2001

Examiner: J. Jillions

For: METHOD AND APPARATUS FOR  
FABRICATION OF A SELF-  
SUPPORTING BANDED COIL  
APPARATUS FOR FABRICATION  
OF A SELF-SUPPORTING  
BANDED COIL

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AMENDMENT

Box Non-Fee Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office action dated December 3, 2002 (Paper No. 7), please amend the above-identified U.S. patent application as follows:

Amendments to the specification begin on page 2 of this paper.

Amendments to the drawings begin on page 5 of this paper.

Remarks/Arguments begin on page 6 of this paper.

EXPRESS MAIL CERTIFICATE

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail, Airbill No. EV262796219US, in an envelope addressed to: Box Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: June 3, 2003 Signature: [Signature]  
(Hua Gao)

In the Specification:

On page 2, line 8, please replace the paragraph beginning with "U.S. Patent No. 5,649,677" with the following rewritten paragraph:

A1  
--U.S. Patent No. 5,649,677 (to Barney Culp, issued July 22, 1997) describes a reel on which a coil of flaccid material can be placed and unwound in a manner opposite to how it was wound in the reel and is also collapsible. However, the method described in this patent is both cumbersome inconvenient and expensive.--

On page 2, line 8, please replace the paragraph beginning with "U.S. Patent No. 5,649,677" with the following rewritten paragraph:

A2  
-- Additional objects of this invention include the an article of manufacture in the form of a banded coil of flaccid product, which can be removed from a spool or reel without unwinding.--

On page 5, line 9, please replace the paragraph beginning with "Fig. 1 provides an exploded view" with the following rewritten paragraph:

A3  
--Fig. 1 provides an exploded view of a take-up spool (10) suitable for use in the method of this invention. In Fig. 1, each of a retaining means (12) and removable flange (20) have been physically displaced relative to a center tube or arbor (16) of a tapered ring (18), which forms the core of the take-up spool (10). As depicted therein, this retaining means (12) comprises a threaded fastener that can be screwed onto the complimentary thread of the center tube (16) of the tapered ring (18). Once this retaining means (12) has been disengaged from this center tube (16), the removable flange (18) (20) can also be disengaged from the center tube or arbor (16) by axial movement thereof, thereby exposing the composite mandrel (22) of the spool (10). The axial movement of this flange (20) also disengages it from a series of interlocking pins (24) (14) associated with a the tapered ring (18) of the take-up spool. These interlocking pins (24) (14) are intended to engage and lock the removable flange (20) in the fixed position relative to the mandrel (22), and thereby allow for transfer of torque to the composite mandrel (22) upon rotation of the removable flange (20).--

On page 6, line 8, please replace the paragraph beginning with "The composite mandrel (22) of Fig. 1" with the following rewritten paragraph:

24 -- The composite mandrel (22) of Fig. 1 also preferably includes a tapered ring (18) which fits within the chamber (32) defined by the curvilinear sections (24, 26 & 28) of the composite mandrel (22). This tapered ring (18) is maintained within the open end (30) of the composite mandrel (22) by means of pressure contact between the exterior surface thereof against the interior of the mandrel. In operation, this tapered ring (18), is positioned within the open end (30) of the mandrel (22), and is mechanically expanded by the combined action of a plurality of springs (34) and a collapsible internal cone (36). More specifically, in the assembly on the spool (10), the tapered ring (18) is initially inserted into the open end (30) of the composite mandrel (22), and the removable flange (20) thereafter installed upon the center tube or arbor (16) of the mandrel (22). When the retaining means (12) is now threaded onto the center tube (16) and tightened, a collapsible cone (36) contained within the tapered ring (18) is reduced in height. More specifically, as the retaining means (12) is tightened, a collapsible internal cone ~~(32)~~ (36), within the tapered ring (18), is compressed in one dimension and thereby expands in the cross-sectional diameter of its base so as to cause the tapered ring (18) to exert radial pressure upon the composite mandrel (22). This expansion of the tapered ring (18) within the mandrel (22) results in frictional engagement of the tapered ring (18) with the inside surface of the flexible mandrel (22). This expansive movement of the tapered ring (18) within the mandrel also results in radial displacement of the curvilinear components (24, 26 & 28) of the composite mandrel (22) and thereby an increase in the cross-sectional diameter of the mandrel. Upon reversal of this process, specifically, the removal of the retainer means (12) and the removal flange (20), the expansive movement of the tapered ring (18) is reversed, so as to allow the collapsible internal cone (36) to return to its uncompressed position. This relaxation of the radial pressure of the tapered ring (18) upon the composite mandrel (22), ~~cause~~ causes a corresponding reduction in the cross-sectional diameter of the mandrel (22).--

On page 7, line 9, please replace the paragraph beginning with "The dynamics of the operation of the take-up spool" with the following rewritten paragraph:

as -- The dynamics of the operation of the take-up spool (10) of this invention are uniquely compatible with the banding of flaccid product that can be wound about the composite mandrel of the take-up spool. That is to say, upon completion of the winding of the flaccid products, to the degree or limits permitted by the physical constraints of the spool, banding straps/cables (not shown) are inserted through the slots (38, 38') in each flange (20, 20'), wrapped and tied about the wound bundle so as to form a self-supporting coil of flaccid product. In order to facilitate this banding, the composite mandrel (22) is also provided with a series of grooves (40, ~~40'~~) corresponding to slots ~~(34, 34')~~ (38, 38') in each of the flanges (20, 20') of the spool (10). These grooves (40, ~~40'~~) in the mandrel, which run along the mandrel from one flange (20, 20') to the other, guide the banding materials under the wound bundle of flaccid product, and thereby allow the banding to secure the bundle into a self-supporting coil prior to its removal from the mandrel. Thus, when the bundle of flaccid product has been secured within the banding, the retaining means (12) can be removed from the threaded end of the tube or arbor (16), and the removable flange (20) disengaged from the composite mandrel (22). As above noted, the combined action of removal of the retaining means (12) and disengagement of the removable flange (20) from the composite mandrel (22) permits relaxation of the radial forces that are exerted by the tapered ring (18) against the interior surface of the composite mandrel (22). This relaxation of the radial forces also causes a reduction in diameter of the composite mandrel, so as to permit release of the banded coil from the curvilinear surface (24, 26 & 28) of the mandrel (22). The banded coil of flaccid product can now be easily removed from the mandrel of the take-up spool, and the spool, thereafter reassembled and reused repeatedly. The banding of the flaccid products in the foregoing manner not only simplifies the shipment thereof, but also substantially reduces the cost of the coil, by reducing shipping costs.--

**In the Drawings:**

The attached sheet of drawing includes the change to Fig. 1. This sheet, which includes Fig. 1, replaces the original sheet including Fig. 1.

Attachment: Replacement Sheet